WHAT IS CLAIMED IS:

1. A medium bearing a deformable model configured to enable a machine to estimate positions of four points defined by X and Y coordinates, each of the points representing a facial element position in a digital image.

2. The medium bearing a deformable model of claim 1 in which the four points include a first point designating a center of a left eye.

3. The medium bearing a deformable model of claim 2 in which the four points further include a second point designating a center of a right eye.

4. The medium bearing a deformable model of claim 3 in which the four points further include a third point designating a left corner of the mouth.

5. The medium bearing a deformable model of claim 4 in which the four points further include a fourth point designating a right corner of a mouth.

6. The medium bearing a deformable model of claim 5 further comprising a variable representing a distance between the first and second points.

7. The medium bearing a deformable model of claim 6 further comprising a variable representing a distance between the third and the fourth points.

8. The medium bearing a deformable model of claim 7 further comprising a variable representing a distance between eyes and mouth.

9. A method comprising:

estimating deformable models including eye positions and mouth positions on each frame of a digital image sequence.

10. The method of claim 9 in which estimating comprises matching a current face deformable model with image features.

11. The method of claim 10 in which the eye positions and the mouth positions are represented by four points defined by X and Y coordinates.

12. The method of claim 11 in which the four points comprise a first point designating a left eye center and represented by i = 1.

13. The method of claim 12 in which the four points further comprise a second point designating a right eye center and represented by i = 2.

14. The method of claim 13 in which the four points further comprise a third point designating a left mouth corner and represented by i = 3.

15. The method of claim 14 in which the four points further comprise a fourth point designating a right mouth corner and represented by i = 4.

16. The method of claim 10 in which the four points of the current face deformable model are determined by six parameters and a base face model.

17. The method of claim 16 in which the six parameters comprise:

a first parameter representing a distance increase between eyes;

a second parameter representing a distance increase between eyes and mouth;

a third parameter representing a distance increase between mouth corners;

a fourth parameter representing a rotation angle;

a fifth parameter representing a shift value along an X axis; and

a sixth parameter representing a shift value along a Y axis.

18. A computer program product, tangibly embodied in an information carrier, for defining a deformable model for facial recognition, the computer program product being operable to cause data processing apparatus to:

estimate base deformable models including eye positions and mouth positions on each frame of a video sequence.

19. The product of claim 18 in which estimate comprises comparing a current face deformable model with a previous face deformable model.

20. The product of claim 19 in which eye corner positions and mouth corner positions are represented by four points defined by X and Y coordinates.

21. The product of claim 20 in which the four points comprise a first point designating a left eye corner and represented by $i = 1$.

22. The product of claim 21 in which the four points further comprise a second point designating a right eye corner and represented by $i = 2$.

23. The product of claim 22 in which the four points further comprise a third point designating a left mouth corner and represented by $i = 3$.

24. The product of claim 23 in which the four points further comprise a fourth point designating a right mouth corner and represented by $i = 4$.

25. The product of claim 20 in which the four points of the current face deformable model are determined by six parameters.

26. The product of claim 25 in which the six parameters comprise:

a first parameter representing a distance increase between eyes;

a second parameter representing a distance increase between eyes and mouth;

a third parameter representing a distance increase between mouth corners;

a fourth parameter representing a rotation angle;

a fifth parameter representing a shift value along an X axis; and

a sixth parameter representing a shift value along a Y axis.

27. A method comprising:

receiving a first digital image in a sequence of digital images and eye and mouth coordinates;

outputting eye and mouth coordinates on a subsequent digital image in the sequence of digital images.

28. The method of claim 27 in which receiving further comprises estimating a base face model and the base face model's transformation parameters T' by the eye and mouth coordinates.

29. The method of claim 28 in which outputting comprises:

calculating an initial model M as a transformed base model M_b using transformation parameters T';

rotating the subsequent image to I(x,y) to generate a normalized model M.

30. The method of claim 29 in which outputting further comprises:

calculating a horizontal and vertical gradient map on the rotated image; and

estimating new transformation parameters T* by minimizing an energy function E(T,I(x,y)), where $T^* = \arg \min_T E(T,I(x,y))$.

31. The method of claim 30 in which minimizing comprises a downhill simplex method with initial transformation parameters T = T'.

32. The method of claim 30 further comprising calculating the eye centers and the mouth corners by the transformed base model using the transformation parameters T*.